BRUHATH BANGALORE MAHANAGARA PALIKE

Name of the Agency	:	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	:	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Estimate Cost	:	Rs.

QUALITY CONTROL REPORTS TO

Asst. Executive Engineer,
Kodigehalli Sub Division,
BBMP, Bangalore.

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QUALITY CONTROL REPORTS FOR

WET MIX MACADAM (WMM)

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Job No.: CTCE/BBMP/W.No 07/HSN/WMM/Gradation/2014-15

02.08.2014

GRADATION FOR WMM

MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. H.S. Nataraj,** Contractor, Bangalore.

Name of Work : Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014

Date of Testing : 02.08.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **8015**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	135	135	1.7	98.3	95-100
22.4	2585	2720	33.9	66.1	60-80
11.2	1290	4010	50.0	50.0	40-60
4.75	1050	5060	63.1	36.9	25-40
2.36	985	6045	75.4	24.6	15-30
0.600	910	6955	86.8	13.2	8-22
0.075	750	7705	96.1	3.9	0-8

Note:

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Job No.: CTCE/BBMP/W.No 07/HSN/WMM/AIV/2014-15

02.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	02.08.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	300	
4	Aggregate Impact value = percent fines	21.32	21.47	
	100* (W_2/W_1)%			**21.39**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No 07/HSN/WMM/S-T/2014-15 02.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E/PMT/55/2014-15 Dated: 18.07.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	02.08.2014

Result : Flakiness Index = **11.56%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **24.81%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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QUALITY CONTROL REPORTS FOR

SEMI DENSE BITUMINOUS CONCRETE

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC(QB)/2014-15 21.08.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Mr. H.S. Nataraj,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	21.08.2014

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The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	84	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	43	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

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21.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP,
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	21.08.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.82	22.02	**21.92**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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21.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP,
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	21.08.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	20.58	20.79	20.68

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/Shape_T/2014-15 : 21.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of Work	: Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 21.08.2014

Result : Flakiness Index = **12.32%**

Elongation Index = **13.85%**

Result : Combined Flakiness & Elongation index **26.17%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

Note:

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of Work	: Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 21.08.2014

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Result : Flakiness Index = **11.86%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **25.11%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of Work	: Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 21.08.2014

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Result : Flakiness Index = **11.86%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **25.11%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

Note:

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/Stripping/2014-15 23.08.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.08.2014

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Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.2	3.30	96.70
2	3.3		
3	3.4		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/Sp_Wa/2014-15

23.08.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	23.08.2014

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Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	2025	2026	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1270	1271	
4	Weight of saturated surface dry aggregate in air	W_3 g	2019	2020	2021	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	750	750	750	
6	Weight of oven dried aggregate	W_4 g	2005	2008	2007	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.673	2.677	2.676	2.676
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.724	2.721	2.727	2.724
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.60%	0.70%	0.66%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/Bit/2014-15 23.08.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. H.S. Nataraj,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
SAMPLE I/D	Roads in Sahakarnagara G Block in Ward No.07, BBMP, Bangalore.
DATE OF TESTING	23.08.2014

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BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.00
7. Bitumen content in %	4.90	5.20
8. Average	**5.05**	

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/Bit/2014-15

23.08.2014

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. H.S. Nataraj,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
SAMPLE I/D	Roads in Sahakarnagara G Block in Ward No.07, BBMP, Bangalore.
DATE OF TESTING	23.08.2014

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GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.35	5.54	5.54	94.46	90-100
4.75	258.3	54.32	59.86	40.14	35-51
2.36	61.22	12.87	72.74	27.26	24-39
1.18	40.25	8.46	81.20	18.80	15-30
0.3	35.32	7.43	88.63	11.37	9-19
0.075	31.22	6.57	95.20	4.80	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	30.25	6.38	6.38	93.62	90-100
4.75	264.5	55.80	62.18	37.82	35-51
2.36	55.35	11.68	73.86	26.14	24-39
1.18	34.26	7.23	81.09	18.91	15-30
0.3	30.22	6.38	87.46	12.54	9-19
0.075	25.69	5.42	92.88	7.12	3-8

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

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Job No.: CTCE/BBMP/W. No 07/HSN/SDBC/AGG/2014-15

23.08.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. H.S. Nataraj,** Contractor, Bangalore.
Name of the Work	Improvements to asphalting roads and drains at Sahakarnagara G Block 10th Cross in Ward No.07, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/55/2014-15 Dated: 18.07.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	23.08.2014

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	380	7.3	7.31	92.69	90-100	
4.75	2580	49.6	56.92	43.08	35-51	
2.36	680	13.1	70.00	30.00	24-39	
1.18	490	9.4	79.42	20.58	15-30	
0.3	280	5.4	84.81	15.19	9-19	
0.075	480	9.2	94.04	5.96	3-8	

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	325	6.1	6.13	93.87	90-100	
4.75	2685	50.7	56.79	43.21	35-51	
2.36	785	14.8	71.60	28.40	24-39	
1.18	435	8.2	79.81	20.19	15-30	
0.3	365	6.9	86.70	13.30	9-19	
0.075	475	9.0	95.66	4.34	3-8	

Civil-Tech Consultants & Engineers Bangalore

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